

Claims

We claim:

1. A method for summarizing a compressed video, comprising:
 - measuring a cumulative motion activity intensity in the compressed video;
 - selecting key frames from the compressed video according to the cumulative motion activity intensity; and
 - concatenating the key-frames in a temporal order to form a summary of the compressed video.
2. The method of claim 1 further comprising:
 - partitioning the compressed video into a plurality of segments, each segment having a substantially equal amount of cumulative motion activity intensity; and
 - selecting one key-frames from each segment.
3. The method of claim 1 wherein the number of segments is one less than a number of desired key-frames in the summary.
4. The method of claim 3 further comprising:
 - selecting a first frame of each segment as one of the key-frames of the summary; and
 - selecting a last frame of the compressed video as a last key-frame of the summary.

5. The method of claim 2 further comprising:
selecting a middle frame according to the accumulated motion activity intensity of each segment as one of the key-frames.
6. The method of claim 1 wherein the motion activity intensity is measured from an average motion vector magnitude.
7. The method of claim 1 wherein the motion activity intensity is measured from a median motion vector magnitude.
8. The method of claim 1 wherein the motion activity intensity is measured from a standard deviation of the motion vector magnitude.
9. The method of claim 1 further comprising:
partitioning the compressed video into a plurality of segments according to shot boundaries;
measuring the cumulative motion activity intensity in each segment;
selecting the key frames from each segment according to the cumulative motion activity intensity; and
concatenating the key-frames in a temporal order to form a summary of the compressed video.
10. The method of claim 1 further comprising:
partitioning the compressed video into a plurality of segments using a binary partitioning based on the cumulative motion activity intensity, wherein a first partitioning generates one segment that includes the entire video, a second partitioning generates two segments, each segment of the second partition having

a substantially equal amount of cumulative motion activity intensity, and each subsequent partitioning dividing segments of a previous partitioning into two equal halves based on the accumulated motion activity intensity until a predetermined number of segments are generated;

selecting a middle frame from each segment according to the cumulative motion activity intensity as one of the key-frames; and

concatenating the key-frames in a temporal order to form a summary of the compressed video.

11. A method for generating a progressive summary of a compressed video, comprising:

selecting key-frames in a progressive ordering from the compressed video until a termination condition is reached; and

concatenating the key-frames in a temporal order to form the progressive summary of the compressed video, the progressive ordering further comprising:

selecting a first frame of the compressed video as a first key-frame;

selecting a last frame of the compressed video as a second frame;

measuring a cumulative motion activity intensity in the compressed video, and selecting a middle frames from the compressed video according to the cumulative motion activity intensity as a third key frame;

partitioning the compressed video into two equal segments according to the motion activity intensity, and selecting a middle frame according to the cumulative motion activity intensity of each segment as a fourth key frame and a fifth key frame; and

iteratively partitioning each previously partitioned segment into two smaller equal sized segments according to the motion activity intensity, and selecting further middle frames according to the cumulative motion activity

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